

Removal of skin staples in an emergency

M K TEOH FRCSEd
Registrar in General Surgery, The General Hospital, Burton on Trent
D A R BURD FRCSEd
Registrar in Plastic Surgery, Leicester Royal Infirmary
T E BUCKNALL MS FRCS
Consultant General Surgeon, The General Hospital, Burton on Trent

Key words: SKIN STAPLES; EMERGENCY REMOVAL

Summary

We have highlighted this problem as there are situations where skin staples have to be removed rapidly, for example where bleeding and subsequent respiratory distress develop following neck surgery.

A survey of junior hospital staff showed that many doctors had never removed skin staples nor were aware how best to remove them in the event of an emergency.

Using skin simulation we compared the time to remove sutures and staples, and found it takes 55% longer to remove skin staples. Where the standard staple remover is not immediately available, an artery forceps, correctly applied, is just as quick.

Introduction

Skin staples are an increasingly popular choice in skin closure because of speed of insertion (1,2). However, the ease and speed of removal, especially in an emergency situation has not previously been studied.

Method

Forty junior doctors in surgical specialities were surveyed to establish their level of awareness and/or experi-

ence of staple removal in the emergency situation with and without the use of a standard staple remover.

The different methods of removing staples were photographed to show the least traumatic way of re-opening stapled wounds using a pair of Halstead forceps.

A controlled experimental study was then set up to compare the fastest wound re-opening times for wounds closed with interrupted Prolene sutures and skin staples. A series of three standard length incisions were made using a skin simulator (a laminated spongy burns dressing) mounted on a board. Six interrupted 4-0 Prolene sutures were inserted in one incision and six staples were inserted in each of the other two incisions, all at 1 cm intervals. Two popular makes of staples (Ethicon and Autosuture Premium®) were used in this study. The times taken to re-open each of the three incisions by the quickest possible means were recorded with a stopwatch. The Prolene sutures were removed by using forceps and scissors. The first of the stapled incisions was opened using a standard (Ethicon) staple remover and the second stapled incision opened using a pair of Halstead artery forceps and a prising action.

Altogether ten sets of results were obtained for each of the three incisions, the experiments being performed by two of the authors (Teoh and Burd) alternatively. A further five sets of results were obtained with three longer

Address for correspondence: T E Bucknall, The General Hospital, New Street, Burton on Trent, Staffs DE14 3QH

TABLE 1 Results of questionnaire, (n=40)

<i>Question</i>		<i>Reply</i>		
		<i>Yes</i>	<i>No</i>	
1	Have you ever worked in a unit where skin staples are used?	33	7	
2	Have you ever seen skin staples being removed?	20	20	
3	Have you ever removed skin staples?	15	25	
		<i>Instrument</i>	<i>Action</i>	<i>n</i>
4	In an emergency you want to re-open a wound closed by staples and a standard staple remover is not available, what would you ask for?	Artery forceps	Prise open	10
		"	Clamp and twist out	9
		"	Clamp and pull out	9
		Scissors	Cut	4
		Wire cutters	Cut	2
		Knife	Make a parallel incision	4
		Any instrument	Pull out	2

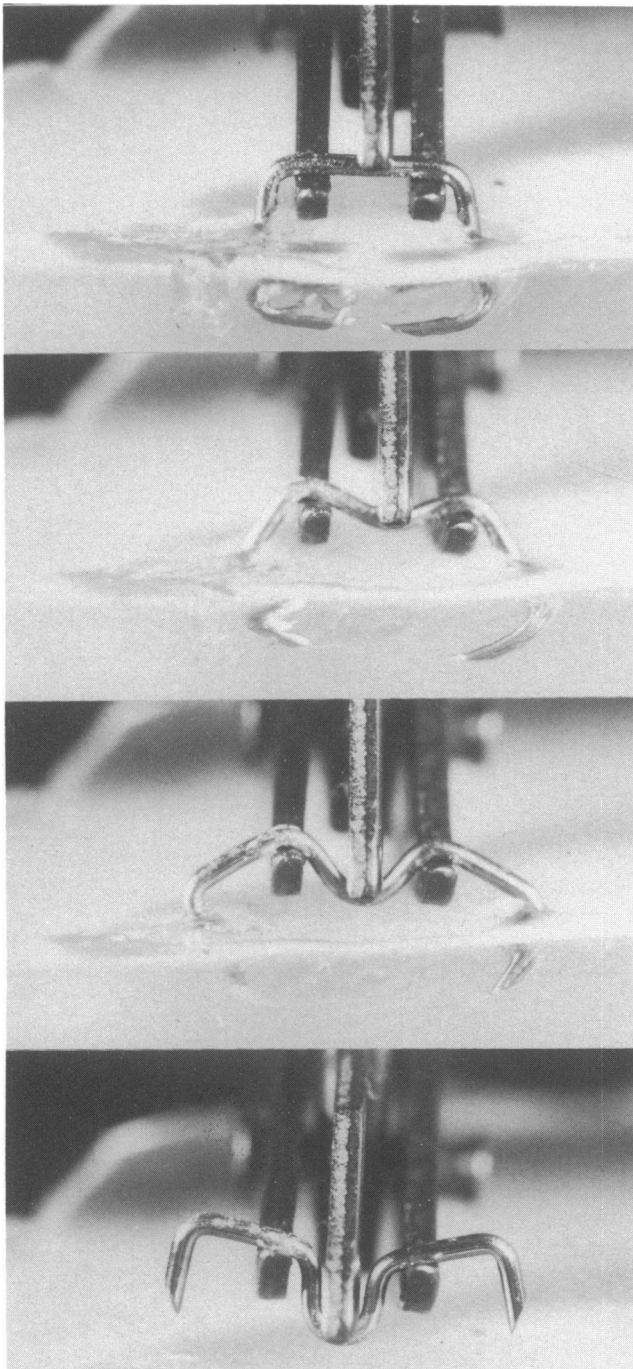


FIG. 1. Standard removal of staple using staple remover.

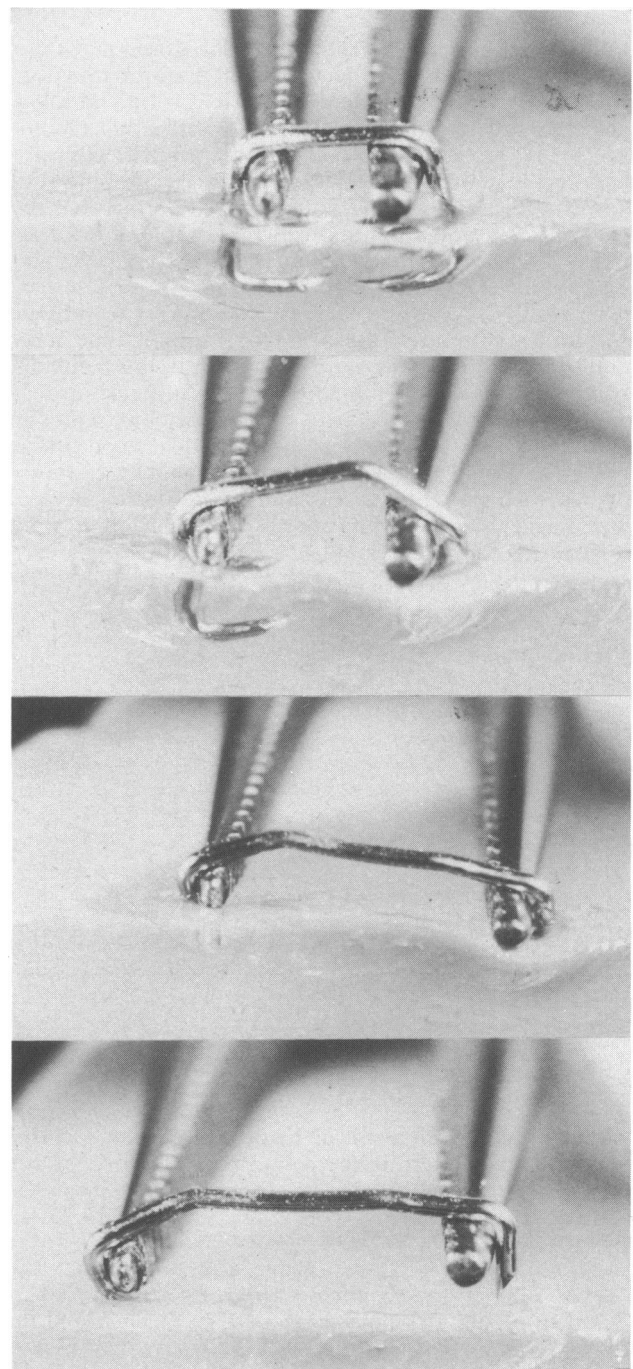


FIG. 2. Artery forceps used to remove staple.

incisions, each having 12 interrupted sutures/staples (instead of six) using the same arrangement.

Results

The results of the questionnaire are shown in Table I. This underlines the general lack of awareness of the problem of staple removal.

Fig. 1 shows the deformation of the staples by the staple remover and Fig. 2 shows the artery forceps prising apart the vertical parts of the staple thus 'unhooking' it from the skin. The staples are too strong to be cut with scissors, and clamping the horizontal part of the staple with the forceps and twisting or pulling is very traumatic to the tissues.

The results of Table II show that it takes significantly longer to remove the skin staples compared to inter-

rupted sutures. The mean time difference being 55%. They also show that staples can be removed as quickly using a Halstead artery forceps when a staple remover is not available.

TABLE II *Time in seconds to re-open incisions*

	<i>Sutures</i>	<i>Staples removed with standard remover</i>	<i>Staples removed with artery forceps</i>
<i>6 sutures/staples</i>			
Mean	17.08 s	26.35 s	27.55 s
sd	3.75 s	7.23 s	5.85 s
<i>12 sutures/staples</i>			
Mean	28.81 s	43.59 s	44.28 s
sd	4.48 s	4.16 s	4.96 s

Discussion

Staples have been used in the United Kingdom and USA for a number of years. They provide a quick and safe form of closure with excellent cosmetic results and a low incidence of infection when compared with other techniques (1). However, a surprisingly large number of junior doctors have never removed them as it is the nursing staff who usually remove the staples postoperatively. An equally large number of junior doctors did not know how to remove the staples in an emergency if a staple remover is not available.

The results show that it takes 55% longer to remove skin staples compared to sutures. Although this delay amounted to only 10 seconds in our study involving six staples, it would be significantly longer in neck surgery wounds where twenty to thirty staples may be used. The experiment was carried out under 'ideal' conditions whereas in a real emergency the delay would certainly increase with patient distress and operator stress. The delay would then be significant. Whilst we have no wish to discourage the use of staples, surgeons must be aware

of the additional problem of staple removal when closing wounds in head and neck surgery, which has the fortunately rare but not unknown, life-threatening complications of major haemorrhage and respiratory distress. What we do recommend most strongly is that it should be part of standard surgical practice to ensure that if staples are used in the 'at risk' patient then a staple remover must *always* accompany the patient in the early postoperative period; (oral surgeons always have wire cutters available near their patients after surgery when there is dental wiring). If a staple remover is not available then artery forceps correctly applied may be life saving.

References

- 1 Bucknall TE, Ellis H. Skin closure. Comparison of Nylon, polyglycolic acid and staples. *Europ Surg Res* 1982;14:96-7.
- 2 George TK, Simpson DC. Skin closure with staples in the accident and emergency department. *J R Coll Surg Edin.* 1985;30:54-56.

Received 7 March 1987

Notes on books

Towards the Eradication of Endemic Goiter, Cretinism and Iodine Deficiency compiled and edited by J T Dunn, E A Pretell, C H Daza and F E Viteri. 419 pages, illustrated, paperback. World Health Organization, Washington. \$10.

The Proceedings of a meeting held in 1983 in Lima. A full review of iodine-deficient goitre the world over with a large part devoted to specific recommendations for prophylaxis and the organization of national campaigns.

Surgical Treatment of Aortic Aneurysms by Denton A Cooley. 215 pages, illustrated. W B Saunders, Philadelphia. £48.50.

Vascular surgeons the world over will be interested to see how an acknowledged master-surgeon operates on aortic aneurysms both intra-thoracic and intra-abdominal. In large format, the many full page ultraclear line diagrams make the techniques appear absurdly easy. It is right that Randall Griepp should point out in a perceptive foreword that although for most of us it is not easy, it is nice to know that it can be. Surely every vascular surgeon will want this volume on their library shelf.

A New Short Textbook of Surgery by Leonard Cotton and Kevin Lafferty. 362 pages, illustrated, paperback. Hodder and Stoughton, Sevenoaks. £12.95.

This is a new edition of a well-known and popular undergraduate textbook of surgery fully revised in a new format and with a new co-author. Orthopaedics and fractures are now omitted but a few key references to each chapter have been added. The layout is clear and inviting and the volume will no doubt continue to attract many of its intended readership.

Robb and Smith's Operative Surgery: Nose and Throat edited by John C Ballantyne and D F N Harrison. 4th edition, 475 pages, illustrated. Butterworths, London. £75.

The fourth edition of this well known volume includes a number of new authors, a large number of new illustrations and a complete updating of the work throughout. An essential purchase for all libraries and laryngology departments.

Robb and Smith's Operative Surgery: Urology edited by W Scott McDougal. 4th edition, 777 pages, illustrated. Butterworths, London. £98.

This fourth edition has been considerably expanded with new chapters on retroperitoneal surgery, stone surgery, radical extirpative surgery for cancer, reconstructive surgery for congenital anomalies, surgery for infertility and traumatic injuries of the genito-urinary system. The remaining chapters have been thoroughly revised to make them current and the volume remains pre-eminent in the field. Sixty seven authors from countries throughout the world give international perspectives and the volume is assured of a wide sale and the need for a fifth edition in years to come.

The Protean Gate by B Csillik and E Knyihar-Csillik. 294 pages, illustrated. Akademiai Kiado, Budapest. £17.25.

The subtitle of this book is Structure and Plasticity of the Nociceptive Analyser. Sited in the upper dorsal horn of the spinal cord this is thought to regulate chronic intractable pain. Readers with a special interest in pain control should find the volume of interest.